REMARKS

Claims 2, 3, 8, 10-13 and 18-21 are pending in the present application and under examination. In the Office Action mailed on March 2, 2006, claims 2-3 were allowed. Claims 8, 10-13 and 18-21 were rejected. The rejection under 35 USC §102 has been removed.

Claims 8, 10-13, and 18-21 have been amended to recite nucleic acid molecules for detection of *N. meningitidis* or expression of an immunogenic peptide. Support for these amendments can be found throughout the specification, for example, at page 5, lines 4 to 6.

Cancellation and amendment of the claims is made without prejudice, without intent to abandon any originally claimed subject matter, and without intent to acquiesce in any rejection of record. Applicants expressly reserve the right to file one or more continuing applications hereof containing the cancelled or unamended claims.

Since the specification provides support for each of the above amendments, entry of these amendments is respectfully requested.

I. REJECTIONS UNDER 35 USC 112, Second Paragraph

Claims 8, 12, 13, and 19-21

Claims 8, 12, 13 and 19-21 have been rejected under 35 USC 112, second paragraph, as allegedly being indefinite for reciting nucleic acids with percent identity to a given sequence but without a stated function.

Applicants respectfully traverse the Examiner's rejection and its supporting remarks. To be definite, a claim must only set forth the metes and bounds of that which is claimed; there is no requirement that the claims set forth the utility. The presently pending claims are directed to compositions rather than methods, so the use of the claimed invention is not part of the metes and bounds of the physical thing claimed. In the interests of expediting prosecution, Applicants have amended claims 8, 12, 13 and 19-21 to recite compositions with two utilities, expression of immunogenic peptides as well as detection of *N. meningitidis*, the utility suggested by the Examiner.

Thus, Applicants assert that in view of the amendments, the rejection of claims 8, 12, 13 and 19-21 under 35 U.S.C. § 112, second paragraph is now moot and respectfully request that the Examiner withdraw the rejection.

Claim 11

The Examiner has rejected claim 11 as allegedly being indefinite for reciting the term "complementary." As suggested by the Examiner, Applicants have amended the claims to recite a nucleotide sequence "fully complementary" to a nucleic acid molecule of claim 8. Thus, Applicants respectfully request that the Examiner withdraw her rejection of claim 11 under 35 U.S.C. § 112, second paragraph.

II. REJECTIONS UNDER 35 USC 112, First Paragraph, Enablement

Claims 8, 12, 13 and 18-21 have been rejected under 35 USC 112, first paragraph, for allegedly failing to enable isolated nucleic acid sequences which have 50% or greater identity to an isolated nucleic acid sequence set forth in SEQ ID NO:3, isolated nucleic acid sequences which encode 10-mer fragments, and isolated nucleic acid sequences which are 80-95% identical to SEQ ID NO:3 with no stated function.

Specifically, the Examiner has asserted that the claims are not enabled due to alleged lack of specific guidance, the unpredictability regarding which amino acids can be changed while still maintaining the function of the nucleic acids of the invention, and the expense and time-consuming nature of the experimentation required to practice the invention.

Applicants respectfully traverse the Examiner's rejection and its supporting remarks.

A. No *prima facie* case

The specification must be taken as complying with the first paragraph of § 112 unless there is a reason to doubt the objective truth of the statements relied upon therein for enabling support (*In*

re Marzocchi, 169 USPQ 367 (CCPA 1971)). The Examiner has not provided any reason to doubt that the specification is enabling. As support for her enablement rejection, the Examiner cites to two articles. However, neither of these articles supports a *prima facie* case for lack of enablement of nucleic acids for expression of immungenic polypeptides or for detection of *N. meningitidis*, as both relate only to the structural requirements for maintaining biological function, e.g., catalysis, of proteins, not to the requirements for retaining immunogenicity or an ability to hybridize to particular sequences.

B. Unpredictability

The Examiner appears to believe that a claim is only enabled if one is able to predict the exact sequence of every nucleic acid within the claim scope. However, by analogy to the monoclonal antibodies in *In re Wands*, this is not an absolute requirement for enablement, 858 F.2d 731 (Fed. Cir. 1988). Under *Wands*, it is well established that claims to monoclonal antibodies directed to a particular protein are enabled even where the application only discloses the sequence of the protein. Clearly, with just the protein sequence, one of skill in the art could not predict the sequences of any of the monoclonal antibodies directed to that sequence. Nevertheless, in *Wands*, the Federal Circuit still found such claims to be enabled on the grounds that is routine for one of skill in the art to immunize an animal such as a rabbit with the protein, generate monoclonal hybridoma from the rabbit and screen them for monoclonal antibodies which are directed to the protein.

The presently claimed nucleic acids are analogous to the monoclonal antibodies claimed in *Wands*. Both sets of claims are directed to biological molecules having a particular function. In *Wands*, the biological molecules were monoclonal antibodies with the function of binding to HBsAg. In the present claims, the biological molecules are nucleic acids with the function of either detection of *N. meningitidis* or expression of an immunogenic polypeptide. Furthermore, as in *Wands*, one of skill can practice the presently claimed invention using routine procedures known to those of skill in the art. In order to identify sequences having an ability to detect *N. meningitidis*, one of skill in the art need only synthesize nucleotide sequences and screen for ability to detect *N. meningitidis*, for example, by a hybridization assay. Using an equally routine procedure, in order to

identify sequences that encode immunogenic polypeptides, one of skill need only synthesize nucleotide sequences, express the encoded protein using standard expression vectors, immunize an animal and draw and screen blood for polyclonal antibodies which recognize a *Neisserial* protein. Both screening via hybridization and drawing and screening polyclonal antibodies in the blood are simpler tasks and even more routine than generating hybridomas and screening monoclonal antibodies produced from them. Thus, under *Wands*, the present claims are enabled even though the application does not disclose the sequence of every nucleic acid in its claim scope.

The present claims are enabled because there are well-established, routine methods of screening that will predictably identify nucleic acids with a claimed function and therefore no undue experimentation is required to determine whether a nucleic acid falls within the claim scope.

C. Amount of Guidance Required

The Examiner has also asserted that the present application lacks sufficient specific guidance regarding which amino acids can be changed while still maintaining the function of the nucleic acids of the invention. However, working examples are not required to enable an invention. See, *e.g.*, MPEP §2164.02; In re Borkowski, 422 F.2d 904, 908 (CCPA 1970). Furthermore, it is well established that guidance need not be provided for the methods if they are readily available to one of skill in the art. See, *e.g.*, MPEP §2164.01 ("A patent need not teach, and preferably omits, what is well known in the art."). The skill in the art with respect to the presently claimed invention is quite high. These nucleic acids are typically isolated by research scientists who are at least Ph.D. level with a fair amount of post-doctoral experience or relevant industry experience. Thus, those of skill in the art are highly capable individuals with a high degree of familiarity with the screening methods needed to identify the claimed invention.

Further, the application provides ample specific guidance regarding the location of immunogenic epitopes. At page 48, lines 23 to 28, the specification identifies and provides citations to references describing three well-established methods for identifying antigenic fragments: hydrophilicity plot, antigenic index, and AMPHI analysis. Using these methods, is is routine for one of skill to identify regions important for maintaining immunogenicity and to avoid making changes in these regions when synthesizing nucleic acids for screening. Applicants provide their own hydrophilicity, antigenic index, and AMPHI analysis of SEQ ID NO: 4 in Figure 4E.

Therefore, instead having to randomly determine which nucleic acid substitutions will maintain immunogenicity of the encoded polypetide, one of skill merely has to look at the provided data and use this as a guide for synthesis of nucleic acids.

D. Quantity of Experimentation

Contrary to the Examiner's assertions, the expense and time required to identify sequences within the claim scope are irrelevant to the question of whether the experimentation is undue. The expense of experimentation is not one of the Wands factors listed in MPEP §2164.01. Further, MPEP § 2164.06 explicitly states that neither the time nor difficulty of experiments are determinative if they are merely routine. As described in the above section, the screening methods required to practice the claimed invention are routine to those of skill in the art.

As made clear in *In re Wands*, a considerable amount of experimentation is permissible if it is merely routine. 858, F.2d 731 (Fed. Cir. 1988). In *Wands*, the Federal Circuit held that "in the monoclonal antibody art it appears that an 'experiment' is not simply the screening of a single hybridoma, but is rather the entire attempt to make a monoclonal antibody against a particular antigen. This process entails immunizing animals, fusing lymphocytes from the immunized animals with myeloma cells to make hybridomas, cloning the hybridomas, and screening the antibodies produced by the hybridomas for the desired characteristics." 858, F.2d at 740. The Federal Circuit further noted that, "[p]ractitioners of this art are prepared to screen negative hybridomas in order to find one that makes the desired antibody." 858, F.2d at 740. The "experiment" of identifying nucleic acids that fall within the scope of the present claims involves design and synthesis of a family of nucleic acids of a particular sequence and then screening for a claimed function. Therefore, by analogy to monoclonal antibodies, it does not matter that one of skill in the art may have to spend considerable time and expense screening more than one nucleic acid to find one with a claimed function.

E. Summary

Thus, Applicants respectfully request that the Examiner withdraw the rejection of Claims 8, 12, 13, and 18-21 based upon 35 U.S.C. § 112, first paragraph, enablement. Just as in *Wands*, the presently claimed invention may be practiced by routine screening methods that will produce the

claimed nucleic acids. The guidance in the specification is sufficient given the routine nature of the screening methods to those of skill in the art. The mere fact that the screening methods may be time-consuming and expensive fails to support the Examiner's rejection.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 223002099101. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

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Respectfully submitted,

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